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## Technical Service

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## Product Information

### TRITON X-114

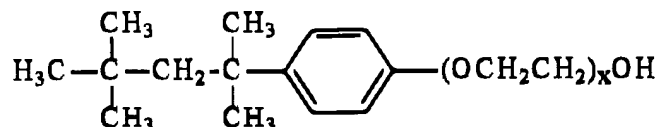
Product Number X-114

Storage Temperature RT°C

CAS #: 9036-19-5

Synonyms: tert-octylphenoxypoly (ethoxyethanol);  
 polyoxyethylene monooctylphenyl ether;  
 octylphenoxypoly (ethyleneoxy) ethanol; tert-  
 octylphenoxy poly(oxyethylene)ethanol

### Product Description



$$x = 7-8$$

Appearance: Clear, pale-straw-colored liquid  
 Average Molecular weight: 537 (based on 7.5 ethylene oxide units)  
 Specific gravity: 1.05-1.08 at 25°C<sup>1</sup>  
 Brookfield viscosity (at 25°C): approximately 260 cps<sup>1</sup>  
 Cloud point: 22-28°C; for 1% solution in water, 20-22°C<sup>1</sup>  
 CMC value: Approximately 0.2 mM or 0.009% (w/w in water)  
 HLB value (calculated): 12.4<sup>2</sup>  
 Pour point: -9°C (18°F)  
 pH of 5% aqueous solution: 6.0-8.0<sup>1</sup>  
 Absorbance: 277 nm, E<sup>1%</sup> = 26-29 (more commonly 27.5-28.7)<sup>3</sup>

Triton X-114 is a nonionic detergent, 100% active ingredient, that is often used in biochemical applications to solubilize proteins. The "X" series of Triton detergents are produced from octylphenol polymerized with ethylene oxide.

At temperatures above the cloud point of a surfactant, solutions separate into aqueous and detergent-enriched phases. It is this property that makes Triton X-114 particularly useful in separating lipophilic proteins from hydrophilic proteins.<sup>4,5</sup> For example, HMG-CoA

reductase was recovered quantitatively in an aqueous phase of a biphasic system formed by Triton X-114 at 30°C.<sup>6</sup> The cloud point of a 1% (w/w) X-114 aqueous solution is increased substantially (to about 50°C) in the presence of small amounts of ionic surfactants (1.25 mM SDS or CTAB). Adding electrolytes to a Triton X-114 solution does decrease the cloud point, the effect being nearly a linear function of the concentration. The combination of electrolyte and ionic surfactant causes a drastic reduction in the cloud point of the Triton X-114 solution.<sup>7</sup>

### Preparation Instructions

Triton X-114 is soluble at 1 g/10 mL in ethanol,<sup>2</sup> but does have some solubility in cold water at least to 5% (w/w). (Above the cloud point, phase separation occurs.) It is insoluble in aliphatic hydrocarbons, but miscible in all proportions in aromatic hydrocarbons and polar organic solvents. It is soluble in hydrochloric, phosphoric and dilute sulfuric acid, but not in concentrated sulfuric acid solutions.<sup>1</sup>

### Storage/Stability

Kept sealed, the product is stable at room temperature for years. Any substance containing ether linkages, however, is subject to the formation of peroxides. For sensitive applications, storage under inert gas at 2-8°C is recommended.

### References

1. Supplier data. Triton is a trademark name owned by Union Carbide Company.
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4. Bordier, C., *J. Biol. Chem.*, 256, 1604-1607 (1981).
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